Impact of the Patient-Centered Medical Home on Veterans' Experience of Care

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ABSTRACT

Objectives: A core tenet of the patient-centered medical home is improving patient experiences of care, but evidence is limited on the impact of medical home adoption on patient experiences of care.

Study Design: We conducted a repeated cross-sectional, patient-level analysis in 1 region of the Veterans Health Administration (VHA), which includes 56 primary care sites.

Methods: Our primary outcomes include 5 domains of patient care experience from the Survey of Healthcare Experiences of Patients (SHEP). We used a linear probability model to test whether changes in medical home implementation are associated with changes in patient experience of care.

Results: During the study period, 30,849 SHEP respondents received care. We observed significant increase in medical home implementation: a 10-fold increase in percentage of primary care providers who were part of a medical home, a 7-fold increase in 8 out of 9 structural measures of the medical home, and an increase in overall quality of medical home implementation. Yet, we found no association between medical home adoption and 5 domains of patient experience of care. For example, patients assigned to a medical home provider had a 0.51 percentage point (95% CI, –1.8 to 2.8) higher response in how well they communicate with their provider compared with patients not assigned to a medical provider and with patients in the pre–medical home period.

Conclusions: Despite wide implementation of the medical home, we did not see an improvement in patient experiences of care in the VHA. As we focus on primary care transformation, we need to find ways to incorporate the patient's voice and input into these transitions.

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Strong primary care systems with services dedicated to providing patient-centered, continuous, comprehensive, and coordinated healthcare may improve patient health outcomes and lower costs.[1-4] The patient-centered medical home (PCMH) is a widely adopted healthcare delivery model that seeks to strengthen primary care. As of 2013, the National Committee for Quality Assurance (NCQA) has recognized over 5000 practices as medical home practice sites.[5] In addition, practice transformation to the medical home model is being tied to payment by several insurers, including CMS, which is investing millions of dollars into medical home practices to achieve the triple aim—improved patient experiences of care, improved quality of care, and reduced costs.[6]

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However, early evidence on adoption of PCMH has demonstrated limited success in achieving these goals.[7,8] Furthermore, there is limited evidence on whether patient experiences of care have improved in this "patient-centered" intervention. Patient experience of care is increasingly being recognized as an important measure of healthcare quality, as patient-centered care is associated with improved patient satisfaction, adherence to physician recommendations, self-management, and health status among individuals with chronic diseases,[9-14] as well as rehospitalization rates and mortality among hospitalized patients.[15,16] Despite the evidence in favor of providing patient-centered care, few studies have investigated the effect of the medical home model on patient-centered care.

To our knowledge, only 3 studies of adult populations have shown a small but positive effect of medical home adoption on elements of patient care experience[17-19] and 2 other studies did not show any effect.[20,21] However, these studies have been limited by small patient samples, limited measures of medical home intervention, and lack of evidence on how well the medical home principles are being implemented across practice sites or on the "dose" of the medical home intervention.

To address several of these challenges, our study uses data from one of the largest national experiments with medical home adoption to date—medical home adoption by the Veterans Health Administration (VHA). The VHA began implementation of the medical home model in April 2010, which it called the Patient Aligned Care Team, or PACT, initiative. The VHA dedicated over $1 billion nationally to PACT implementation.

Take-Away Points

Large-scale adoption of the patient-centered medical home in the Veterans Health Administration is, in part, being implemented to improve patient experiences of care, but evidence is limited on the impact of medical home adoption on veterans' experiences of care.

- We found medical home providers increased from 8.2% in 2010 to 81.1% in 2012.
- We observed a 7-fold increase in adoption of 8 out of 9 structural measures of the medical home.
- However, we observed no association of medical home implementation on 5 domains of patient care experiences.
- We need to understand which medical home elements impact patient-centered care.

The PACT initiative's main goals for primary care are for it to become more comprehensive, coordinated, and patient centered.[22] While similar in focus to NCQA medical home recognition, that tool, in several areas, may not be appropriate for the VHA setting. In fact, the VHA has been a leader in several NCQA medical home domains, such as health information technology infrastructure, electronic prescribing, patient registries, and quality performance measurement.[23,24] Thus, a major focus for evaluating the PACT initiative has been on how effectively these resources are being implemented.[25]

To measure the effect of this implementation on patient experience of care, we used a mixed-methods approach, linking data from a series of structured interviews with a staff of more than 50 primary care sites on the extent and success of PACT implementation with data on patient experience of care for more than 30,000 veterans.

METHODS

Overview

To examine the effect of PACT implementation on patient experience of care, we used 2 sources of variation: the timing and the effectiveness of PACT implementation across study sites. In doing so, we measured the impact of having a PACT primary care provider (PCP) on a patient's experience of care, and the impact of how effectively a clinic has implemented the PACT model on that same experience. Using a repeated cross-sectional design, we conducted patient-level analyses, with patients clustered within PCPs and sites of care, to test whether changes in healthcare delivery in the VHA under the PACT transformation led to changes in patient experience of care.

Study Population

Our study was based in a large mid-Atlantic region of the VHA (Veterans Integrated Service Networks [VISN] 4), which includes 56 primary care sites providing care for more than 300,000 veterans. Our study cohort included patients who responded to the Survey of Healthcare Experiences of Patients (SHEP) between July 2010 and October 2012 within VISN 4. SHEP is mailed monthly to a random sample of veterans with an outpatient visit in the previous 30 days, stratified by clinic site and physician type (primary care vs specialist).[26] The national response rate for the outpatient SHEP in the 2010 survey was 53.2%.[27]

Measures

Main independent variables. Our independent variables are derived from detailed interview-based qualitative data conducted in VISN 4 on PACT implementation. Below, we have included a detailed overview of the 3 methods we used to measure PACT implementation. A full description of the mixed-methods methodology and interview guides used to derive each independent variable has been published previously.[28]

Measure of timing of PACT implementation. The first measure of PACT implementation was based on the dates that each PCP in the VISN became a PACT provider. We created a binary variable that equaled 1 when a provider became a PACT provider, and 0 before. Providers were considered to be PACT providers once they had started the PACT training process.

Measure of structural change to support PACT implementation. The second measure of PACT implementation measured whether and when specific structural changes in primary care delivery were made. We conducted site visits and structured interviews with key informants at each site with the goal of identifying key structural elements of PACT implementation. Key informants were the persons at each site charged with day-to-day responsibilities related to PACT implementation. In cases where the initial contact was unable to answer all of the questions, we identified a second contact.

Structured interviews were based on an interview guide asking about structural changes to support PACT implementation in the following 10 areas: 1) accessing and

using data for quality improvement; 2) care management of high-risk patients; 3) nurse medication protocols; 4) transitions from the emergency department; 5) transitions from the hospital; 6) alternatives to single-provider face-to-face visits; 7) changes to enhance access; 8) multidisciplinary teams; 9) team communication and functioning; and 10) using patient-centered methods (see **eAppendix 1**, available at **www.ajmc.com**, for interview guide). Five sets of interviews were conducted at 6-month intervals over the 2.5-year period of this study (July 2010 to December 2012 [the end month for the data analyzed]).

We summarized the interview data by creating binary variables for 9 of the 10 structural changes, indicating whether the site used any of the specific structural changes in each 6-month period—we did not include responses to queries about accessing and using data for quality improvement as respondents were often confused by this question. For example, in asking about changes to support enhanced access, we created a variable equal to 1 if a clinical site answered "yes" to any of the following questions in each time period: Are any strategies in place for enhanced access? Are scheduling scrubbing methods in place? Are you extending visit intervals when appropriate? Are you using any other methods to enhance access?

Measure of the overall quality of PACT implementation. Finally, we created one scale variable measuring the overall quality or effectiveness of PACT implementation at each site. Based on the responses to the questions on implementation of the structural measures, the interviewer was asked to rate the effectiveness of the implementation on a 5-point Likert scale ranging from 0 (if a particular structural change had not been made) to 4 (if fully implemented) for each of the 10 measures—consisting of the 9 structural measures (after dropping the question on data access) and a measure of support from leadership. We then summed these scale ratings across the 10 questions, resulting in a summary score with a range of 0 to 40. Previous factor analysis demonstrated that the 10 items function as a summative scale with Cronbach's alpha for the 10 items being greater than 0.75 in 4 time periods.

Dependent Variables

Our primary outcome variables include 5 measures of patient care experience: how well doctors/nurses communicate, rating of personal doctor/nurse, getting needed care, overall rating of Veterans Affairs (VA) healthcare, and getting care quickly. We used a standardized method to aggregate and dichotomize SHEP responses (**eAppendix 2**). For example, a survey respondent was asked the following questions: "A personal doctor or nurse is the one you would see if you need a checkup, want advice about health problem or get sick or hurt. Do you have a personal VA doctor or nurse?" (Response options: yes, no); and "Using any number from 0 to 10, where 0 is the worst personal doctor/nurse possible and 10 is the best personal doctor/nurse, what number would you use to rate your personal VA doctor/nurse?" The respondent was counted only if they had a personal VA doctor or nurse. Next, we created a variable equal to 1 if the respondent gave a score of 9 or 10.

We analyzed SHEP survey responses from July 2010 through fiscal year 2012 in the VHA, which ended in September 2012. In the VHA, patients are assigned a primary care provider at the time of enrollment. This data was linked to PACT implementation data by linking the SHEP survey to corresponding PACT data based on the provider and clinic site and the date of the encounter.

Covariates

For each SHEP survey respondent we obtained age, sex, ethnicity, and race from the self-reported survey data. We linked the respondent's zip code with 2012 Census American Community survey data to obtain the median household income. In addition, we used the RiskSmart Diagnostic Cost Group (DCG) files at the VA Austin Information Technology Center from the same fiscal year as the SHEP survey date to account for illness severity. All patient cohort data and covariates are listed in **Table 1**.

Statistical Analysis

We conducted patient-level analyses, with patients clustered within PCPs, using linear probability models to test whether changes under PACT transformation were associated with changes in patient experience of care. We used the following general form to test our hypotheses:

$$Outcome_{i,j,t} = \alpha PACT_{j,t} + X_i + \beta PCP + \varepsilon_{i,j,t}$$

In this regression, the outcome variable is 1 of 5 defined patient experience outcomes, indexed to patient (i), PCP (j) and 6-month time period (t). The coefficient of interest is alpha, representing the effect of a PCP changing PACT implementation status on the outcome of interest. We modeled PACT implementation in 3 ways, as defined above: 1) a dummy variable indicating whether each PCP was a PACT provider in that study period; 2) a scale variable measuring the quality of PACT implementation in each study period for those providers who are PACT (non-PACT providers were assigned a value of zero); and 3) a vector of 9 dummy variables indicating whether

Table 1. Description of Patient Cohort

Total patients	30,849
Age, years, median (IQR)	68 (62-79)
Male	96%
Hispanic	1%
Race	
White	92%
Black	6%
Other	2%
Median annual household income by zip code	
<$35,000	10%
$35,000-$49,999	42%
$50,000-$74,999	37%
>$75,000	11%
DCG risk score, median (IQR)	0.32 (0.11-0.82)

DCG indicates RiskSmart Diagnostic Cost Group; IQR, interquartile range.

PACT providers had implemented each structural change in each study period. We thus estimated the above equation 15 times, using the 5 outcome variables in combination with each of the 3 PACT implementation variables.

In our analysis, we controlled for patient-level covariates (ie, age, gender, income, ethnicity, race, and DCG risk score). In addition, we included PCP fixed effects (controlling for time-invariant differences across providers, allowing us to identify the effect of providers changing PACT status and allowing each PCP to serve as a control for him or herself), 6-month time period fixed effects (controlling for secular changes in the outcomes that are common to PACT and non-PACT providers), and a mean 0 random error component. All standard errors were adjusted for clustering within PCP using Huber-White estimators of variance.[29,30]

RESULTS

Between July 2010 and September 2012, 30,849 patient experience surveys were completed in VISN 4 that were linked to a provider and clinic site. Descriptions of the patient characteristics are shown in Table 1. A majority of our cohort of veterans were white males 65 years and older. The overall results of the SHEP survey demonstrate that veterans had a favorable patient experience of care in 3 domains: overall rating of VHA healthcare, overall rating of personal doctor/nurse, and how well doctor/nurse communicates (Figure 1).

During the 2.5-year study period of PACT implementation, there was a 10-fold increase in veterans who had a PACT provider (Figure 2). In addition, the percentage of PCPs who implemented specific elements of the PACT model increased in 8 of 9 measures (Table 2). For example, the percentage of PCPs who adopted high-risk registries increased from nearly 7% in the first time period to 64% in the last period. In contrast, we did not see an increase in the use of nurse medication protocols. During the study period, we also found that the quality of PACT implementation increased from 1 to 14 among PCPs in the cohort.

Our regression models examined the effect of PACT implementation measured in the 3 different ways on 5 domains of patient experience of care. Although we saw a substantial increase in the number of veterans with a PACT provider, in the PACT quality level, and in the adoption of PACT structural measures, we find little impact of PACT implementation on patient experience of care (Table 3). For example, having a PACT provider did not have an effect in any of the 5 patient care experience domains. In these models, the adjusted percentage-point difference in positive responses to patient experience of care between having a PACT provider and not having a PACT provider was less than 1 percentage point and not statistically significant. Similarly, there was no effect of a 10-point increase in the PCP PACT quality scale on any patient care experience measures.

Finally, we found that the effect of specific structural changes on patient care experience was generally small and not statistically significant. For 2 structural mea-

Figure 1. Patients' Positive Responses to the Survey of Healthcare Experiences of Patients

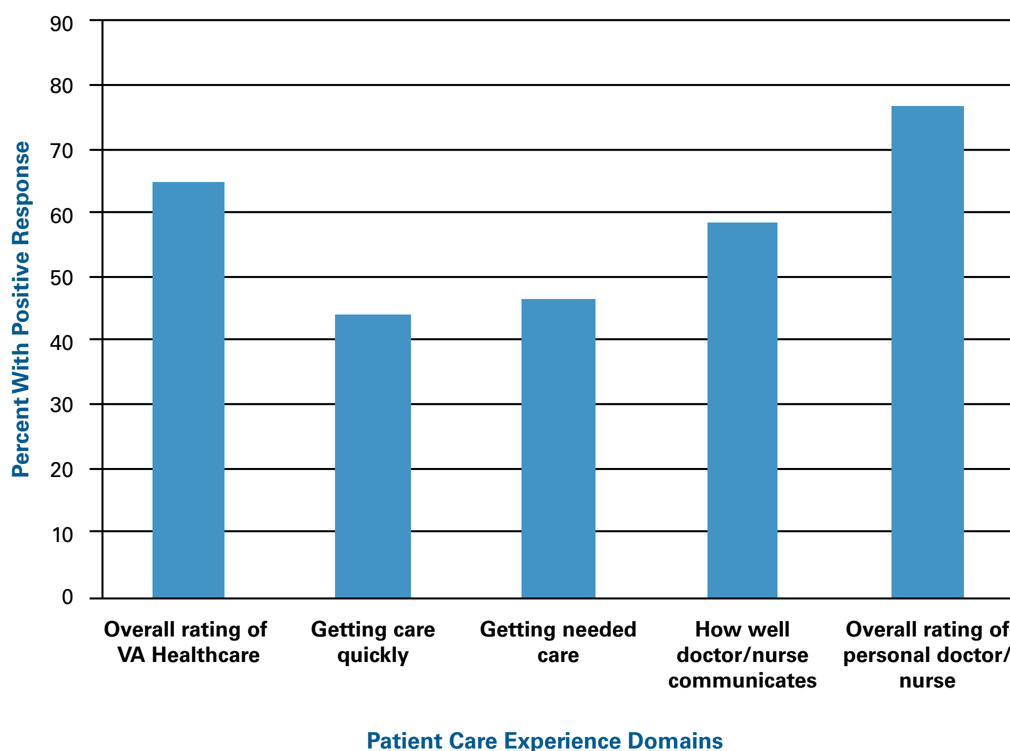
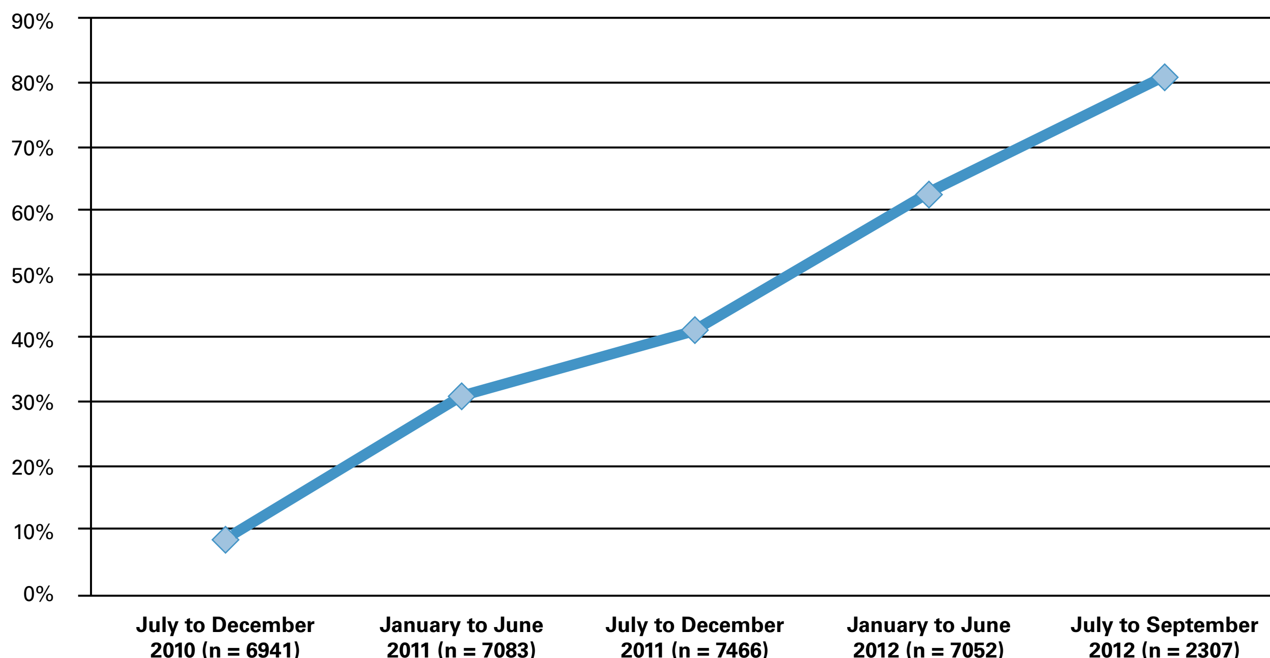


Figure 2. Percentage of Patients With a PACT Provider Over the Study Period



n = total number of patients in the given time period.

Table 2. Number (and percent) of PCPs Adopting Structural Changes in Support of PACT, and Quality of PACT Implementation in Each Study Period

	July-December 2010 (n = 414)	January-June 2011 (n = 418)	July-December 2011 (n = 405)	January-June 2012 (n = 409)	July-September 2012 (n = 340)
High-risk registries, n (%)	29 (6.9%)	123 (29.4%)	149 (36.9%)	231 (56.5%)	218 (64.2%)
Nurse medication protocols, n (%)	14 (3.3%)	56 (13.4%)	58 (14.2%)	70 (17.1%)	32 (9.5%)
Transitions from ED, n (%)	16 (3.8%)	125 (30.0%)	57 (37.4%)	248 (60.6%)	258 (75.8%)
Transitions from hospital, n (%)	23 (5.6%)	121 (29.0%)	57 (37.4%)	256 (62.5%)	276 (81.1%)
Alternatives to face-to-face and one-on-one visits, n (%)	21 (5.1%)	109 (26.1%)	157 (38.8%)	256 (62.5%)	276 (81.1%)
Enhanced access, n (%)	31 (7.4%)	87 (20.9%)	152 (37.6%)	256 (62.5%)	276 (81.1%)
Multidisciplinary teams, n (%)	33 (7.9%)	87 (20.9%)	155 (38.3%)	245 (59.9%)	269 (81.1%)
Team communication and functioning, n (%)	18 (4.3%)	115 (27.5%)	157 (38.8%)	232 (56.8%)	266 (78.3%)
Patient centeredness, n (%)	8 (2.0%)	108 (25.9%)	113 (28.0%)	238 (58.1%)	268 (78.8%)
PACT quality level among all PCPs,[a] mean (SD)	1.0 (3.7)	6.2 (10.1)	7.4 (10.3)	11.4 (9.9)	14.4 (8.2)

ED indicates emergency department; PACT, Patient Aligned Care Team initiative; PCP, primary care practice.
[a]The PACT quality level is the sum of 5-point Likert scales across 10 individual items. The possible range of values is thus 0 to 40.

sures—alternative to face-to-face visits, and team communication and functioning—we found inconsistent results. We found that having alternatives to face-to-face visits was associated with a nearly 7-percentage-point (95% CI, –14.6 to –0.6; *P* = .03) worse rating in getting care needed, but we also discovered that policies related to team communication and functioning were associated with a 4-percentage-point (95% CI, 0.2-9.5; *P* = .04) higher rating in overall rating of the VHA.

DISCUSSION

A key foundation of the PCMH is improving patient experiences of care. However, despite wide adoption of the PCMH, there is little evidence of the impact of medical home transformation on patient experience of care.

We examined the impact of medical home implementation in the VHA on patient experiences of care. Over a 2.5-year time period, we found that there were significant structural changes made to improve primary care delivery. In a majority of structural measures of PACT implementation, primary care providers increased their adoption of these PCMH elements more than 7-fold. However, in our primary analysis, having a PACT provider or having PACT more effectively implemented was not associated with evidence of higher ratings in 5 major domains of patient care experience. We also found that a majority of structural measures were not associated with patient care experience; 2 cases were exceptions. Because we had multiple comparisons, these exceptions may in part be due to

Table 3. Adjusted % Point Difference (and 95% CIs) in Patient Care Experience Associated With PACT Implementation

	How Well Doctor/Nurse Communicates	Getting Care Quickly	Getting Needed Care	Overall Rating of VA Healthcare	Overall Rating of Personal Doctor/Nurse
n = Number of patient survey responses	n = 25,809	n = 8390	n = 13,789	n = 30,557	n = 26,723
The effect of a PCP becoming a PACT provider on patient experience of care					
PACT provider	0.51 (–1.8 to 2.8)	–0.42 (–4.3 to 3.5)	0.51 (–2.6 to 3.6)	0.00 (–1.9 to 1.9)	–0.37 (–2.1 to 1.4)
P	.66	.83	.74	.99	.68
The effect of a 10-point increase in a provider's PACT quality rating on patient experience of care					
PACT quality rating	0.26 (–1.0 to 1.5)	0.20 (–1.9 to 2.3)	0.30 (–1.3 to 1.9)	0.14 (–0.9 to 1.2)	0.21 (–0.7 to 1.2)
P	.68	.85	.72	.79	.66
The effect of PACT providers implementing structural changes supporting the PACT model on patient experience of care					
Nurse medication protocols	–1.37 (–4.4 to 1.6)	0.34 (–5.2 to 5.9)	–3.22 (–7.3 to 0.8)	1.20 (–1.6 to 4.0)	–0.48 (–2.8 to 1.8)
P	37	.90	.12	.40	.68
Alternatives to face-to-face and one-on-one visits	0.37 (–5.6 to 6.3)	0.78 (–11.1 to 12.6)	–7.63[a] (–14.6 to -0.6)	–3.50 (–8.1 to 1.1)	–1.79 (–6.8 to 3.2)
P	.90	.90	.03	.14	.48
Enhanced access	–2.45 (–8.4 to 3.5)	–4.61 (–19.5 to 10.3)	3.13 (–7.2 to 13.4)	–3.77 (–8.8 to 1.2)	–3.79 (–8.3 to 0.8)
P	.42	.54	.55	.14	.10
Multidisciplinary team	2.78 (–2.4 to 7.8)	4.48 (–9.0 to 18.0)	–5.61 (–14.4 to 3.2)	2.04 (–3.3 to 7.4)	3.27 (–0.6 to 7.2)
P	.29	.51	.21	.45	.07
Team communication and functioning	–2.30 (–7.9 to 3.4)	–3.85 (–12.8 to 5.1)	6.17 (–0.1 to 12.5)	4.84[a] (0.2 to 9.5)	0.53 (–3.5 to 4.6)
P	.43	.40	.05	.04	.80
High-risk registries	2.13 (–1.5 to 5.8)	–3.53 (–11.4 to 4.4)	2.07 (–3.2 to 7.3)	1.02 (–2.0 to 4.1)	–0.59 (–3.5 to 2.3)
P	.25	.38	.44	.51	.69
Post ED transitions	–3.40 (–8.8 to 2.0)	1.76 (–10.1 to 13.7)	1.30 (–7.0 to 9.6)	–3.74 (–8.2 to 0.7)	–1.59 (–5.7 to 2.5)
P	.22	.77	.76	.10	.44
Post hospital transitions	3.57 (–1.5 to 8.6)	0.37 (–10.2 to 10.9)	3.46 (–5.4 to 12.3)	2.65 (–1.3 to 6.6)	3.04 (–1.1 to 7.2)
P	.16	.95	.45	.19	.15
Patient centeredness	–0.03 (–4.0 to 3.9)	3.97 (–2.0 to 10.0)	–1.20 (–5.6 to 3.2)	–0.07 (–3.1 to 3.0)	1.19 (–1.7 to 4.0)
P	.99	.20	.60	.97	.41

ED indicates emergency department; PACT, Patient Aligned Care Team initiative; PCP, primary care practice; VA, Veterans Administration.
[a]$P < .05$.
PACT implementation is measured in 3 ways and each type of measure is modeled separately in linear regression.

chance alone.

Our results represent an important contribution to the evidence on PCMH implementation and patient care experience. First, we provide evidence from one of the largest PCMH implementation initiatives in the country using a large cohort of patients. Second, we did not measure medical home implementation simply as an on-off switch; we also evaluated whether there was a dose effect of medical home on patient care experiences. By using qualitative data, we not only evaluated if successful imple-

mentation matters, but also which structural changes to support the medical home matter, if any. Although we did not find an association with medical home implementation on patient experience, this may simply represent the complexity required to measure and implement the medical home in practice.

On one hand, our results may seem surprising. We expected that improvement in patient experiences of care would be a core outcome of PCMH transformation. However, improving patient experiences of care is complex and influenced by an array of patient and social factors, including previous healthcare interactions, expectations, and attitudes that exist prior to any current experience within a healthcare system.[20,31] It may be difficult for medical home transformation to influence the myriad of characteristics required to impact patient experience of care, especially over a relatively short period of time.

Limitations

Our study has several important limitations. First, the medical home model may have significant lag effects. PCMH, like other innovations, may take time to have significant impact on patient experiences of care. During this early phase of primary care transformation, we may be measuring the effect of unanticipated disruptions needed for practices to become functional medical homes. Second, as with most survey data, we may have response bias. For example, we had a limited sample of racial and ethnic minorities, which can influence the generalizability of our findings in this population. In addition, given the changes to primary care delivery, patients with strong opinions—positive or negative—may have undue influence on our findings. Third, this is an observational study, and as such causality cannot be inferred. Finally, while we use 3 unique measures of medical implementation, most based on qualitative data, this method has limits. For example, we assume providers become fully trained in PACT implementation on the date they became a PACT provider. However, providers may in fact take weeks to years to become proficient at implementing the principles of the medical home. While the interviewees were told about the confidentiality of the interviews, they may have overstated the positives that the clinic and providers have made in medical home transformation.

CONCLUSIONS

Despite several limitations, our study provides important insights on the impact of medical home implementation on patient experiences of care. Most medical home implementation efforts have focused on the establishment of key structural elements of the model without sufficient emphasis on the interpersonal aspects of primary care that contribute to improving patients' experience of care. Increasing focus on these relational aspects around improved communication and trust may be central to improving patient care experience. As we move forward with the medical home model, it will be key to obtain more qualitative and quantitative data on what patients want in a medical home or a primary care practice more generally. As we focus on primary care transformation to improve healthcare delivery, we need to find ways to incorporate the patient's voice and input into these transitions.

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REFERENCES

1. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q.* 2005;83(3):457-502. Review.
2. Bodenheimer T, Fernandez A. High and rising health care costs. part 4: can costs be controlled while preserving quality? *Ann Intern Med.* 2005;143(1):26-31.
3. Greenfield S, Rogers W, Mangotich M, Carney MF, Tarlov AR. Outcomes of patients with hypertension and non-insulin-dependent diabetes mellitus treated by different systems and specialties. results from the medical outcomes study. *JAMA.* 1995;274(18):1436-1444.
4. Parchman ML, Culler S. Primary care physicians and avoidable hospitalizations. *J Fam Pract.* 1994;39(2):123-128.
5. NCQA Patient Centered-Medical Homes. Fact Sheet 2013. National Committee for Quality Assurance website. http://www.ncqa.org/Portals/0/Newsroom/2013/pcmh%202011%20fact%20sheet.pdf. Accessed May 14, 2015.
6. Baron RJ. New pathways for primary care: an update on primary care programs from the innovation center at CMS. *Ann Fam Med.* 2012;10(2):152-155.
7. Peikes D, Zutshi A, Genevro JL, Parchman ML, Meyers DS. Early evaluations of the medical home: building on a promising start. *Am J Manag Care.* 2012;18(2):105-116.
8. Friedberg MW, Schneider EC, Rosenthal MB, Volpp KG, Werner RM. Association between participation in a multipayer medical home intervention and changes in quality, utilization, and costs of care. *JAMA.*

2014;311(8):815-825.

9. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. *J Fam Pract.* 2000;49:796-804.

10. Roter DL. Observations on methodological and measurement challenges in the assessment of communication during medical exchanges. *Patient Educ Couns.* 2003;50(1):17-21.

11. Post DM, Cegala DJ, Miser WF. The other half of the whole: teaching patients to communicate with physicians. *Fam Med.* 2002;34(5):344-352.

12. Pignone M, Bucholtz D, Harris R. Patient preferences for colon cancer screening. *J Gen Intern Med.* 1999;14(7):432-437.

13. Stewart MA. Effective physician-patient communication and health outcomes: a review. *CMAJ.* 1995;152(9):1423-1433.

14. Kaplan SH, Greenfield S, Ware JE Jr. Assessing the effects of physician-patient interactions on the outcomes of chronic disease. *Med Care.* 1989;27(3 suppl):S110-S127.

15. Record JD, Rand C, Christmas C, et al. Reducing heart failure readmissions by teaching patient-centered care to internal medicine residents. *Arch Intern Med.* 2011;171(9):858-859.

16. Meterko M, Wright S, Lin H, Lowy E, Cleary PD. Mortality among patients with acute myocardial infarction: the influences of patient-centered care and evidence-based medicine. *Health Serv Res.* 2010;45(5, pt 1):1188-1204.

17. Reid RJ, Fishman PA, Yu O, et al. Patient-centered medical home demonstration: a prospective, quasi-experimental, before and after evaluation. *Am J Manag Care.* 2009;15(9):e71-e87.

18. Heyworth L, Bitton A, Lipsitz SR, et al. Patient-centered medical home transformation with payment reform: patient experience outcomes. *Am J Manag Care.* 2014;20(1):26-33.

19. Kern LM, Dhopeshwarkar RV, Edwards A, Kaushal R. Patient experience over time in patient-centered medical homes. *Am J Manag Care.* 2013;19(5):403-410.

20. Martsolf GR, Alexander JA, Shi Y, et al. The patient-centered medical home and patient experience. *Health Serv Res.* 2012;47(6):2273-2295.

21. Jaén CR, Ferrer RL, Miller WL, et al. Patient outcomes at 26 months in the patient-centered medical home National Demonstration Project. *Ann Fam Med.* 2010;8 (suppl 1):S57-S67;S92.

22. Rosland AM, Nelson K, Sun H, et al. The patient-centered medical home in the Veterans Health Administration. *Am J Manag Care.* 2013;19(7):e263-e272.

23. Jha AK, Perlin JB, Kizer KW, Dudley RA. Effect of the transformation of the Veterans Affairs Health Care System on the quality of care. *N Engl J Med.* 2003;348(22):2218-2227.

24. Kizer KW. The "new VA": a national laboratory for health care quality management. *Am J Med Qual.* 1999;14(1):3-20. Review.

25. Nelson KM, Helfrich C, Sun H, et al. Implementation of the patient-centered medical home in the Veterans Health Administration: associations with patient satisfaction, quality of care, staff burnout, and hospital and emergency department use. *JAMA Intern Med.* 2014;174(8):1350-1358.

26. Wright SM, Craig T, Campbell S, Schaefer J, Humble C. Patient satisfaction of female and male users of Veterans Health Administration services. *J Gen Intern Med.* 2006;21(suppl 3):S26-S32.

27. Hausmann LR, Gao S, Mor MK, Schaefer JH Jr, Fine MJ. Understanding racial and ethnic differences in patient experiences with outpatient health care in Veterans Affairs Medical Centers. *Med Care.* 2013;51(6):532-539.

28. Werner RM, Canamucio A, Shea JA, True G. The medical home transformation in the Veterans Health Administration: an evaluation of early changes in primary care delivery. *Health Serv Res.* 2014;49(4):1329-1347.

29. Huber PJ. The behavior of maximum likelihood estimates under nonstandard conditions. *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*. 1967;1(1):221-233. http://projecteuclid.org/euclid.bsmsp/1200512988.

30. Halbert W. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica: Journal of the Econometric Society.* 1980;48(4):817-838.

31. Rodriguez HP, von Glahn T, Rogers WH, Safran DG. Organizational and market influences on physician performance on patient experience measures. *Health Serv Res.* 2009;44(3):880-901. ■

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eAppendix 1. Tracking PACT Interview Guide

[Copied as is from the original.]

Station Number: Site:
Interviewee: Interviewer: Date:

1. Support from Leadership

There are several ways in which a facility's executive leadership, that is the members might or might not be engaged in or supportive of PACT implementation. Please think of the time period between July and December of this year.

How supportive of PACT implementation was your leadership? Please rate their support from 1 to 5, with 1 being "not at all", 3 "somewhat", and 5 being "very supportive".	1-Not at all 2 3-Somewhat 4 5-Very
Please offer 2 short examples of support:	1. 2.
Please offer 2 short examples of barriers or support you may still require from leadership:	1. 2.
Level of Leadership Support?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Have Members of Quadrad/Pentad participated in PACT activities? (e.g., serve on steering committee; or PACT POC indicates someone at this level has met with them or attended PACT meetings, etc.)

b) [Other than the support you mentioned earlier] has the executive leadership provided resources for PACT implementation? (e.g., assistance from business office staff with data pulls, new hires for PACT, additional space or renovated space for PACT)

c) Has the leadership expressed positive views of overall PACT initiative? (e.g., confidence in VA's long-term commitment to PACT, etc.)

d) Has the leadership expressed positive views of local PACT implementation activities? (e.g., understanding of local implementation plan and status, realistic expectations related to understanding nation-wide expectations and where facility is relative to others)

2. Accessing & Using Data for Quality Improvement

Now, let's talk about your site's ability to access, collect and use data for PACT implementation. Please think of the time period between July and December of this year.

Did you have someone who is able to access data and reports needed for implementation activities?	No= 0 Yes= 1

Do you feel that you had appropriate levels of support from your data support person?	No= 0 Yes= 1
Please offer one example of success related to data access. Please offer one example of barrier related to data access.	1. 2.
Level of Data Access for use and QI	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) How has your site used the data? Please offer some examples of how data was used at (facility name).

b) Has your site identified any best practices or ways to communicate or spread these practices to other PACT teams?

c) Has your site identified any alternative way to access data needed to implement changes (e.g., panel review by provider, other)?

3. Care Management of High-Risk Patients

Now, let's talk about the care management of high risk patients, and how far along the PACT teams are in terms of implementation. Please think of the time period between July and December of this year.

Did you use a High Risk Registry (HRR)?	No= 0 Yes= 1
HRR Target- Hypertension?	No= 0 Yes= 1
HRR Target- Lipids?	No= 0 Yes= 1
HRR Target- Diabetes?	No= 0 Yes= 1
HRR Target- Complex Comorbidities?	No= 0 Yes= 1
HRR Target- Frequent ED/Hosp Visit?	No= 0 Yes= 1
HRR Target-Frequent PC usage?	No= 0 Yes= 1
HRR Target-ID'd as High Need?	No= 0 Yes= 1
HRR Target-Other?	No= 0 Yes= 1 Who:
Did you use the CAN Score? (Care Assessment Needs score-- tool to help primary care teams identify patients at highest risk of hospital admission or death in order to intervene with these patients and provide services.)	No= 0 Yes = 1
Level of use of HRR	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) About what percentage of patients across PACT teams panels were on registry?

b) About how many veterans received care management per 1 FTE care manager?

c) Did you have….
   i. Established criteria for removing patients from list?

   ii. Systematic process for maintaining/managing list?

   Is this standardized across all implementing teams?

d) Has your site been able to realign staff to provide care management?

4. Nurse Medication Protocols

Next, I'd like to ask about nurse medication protocols. Which, if any, of the following protocols have been approved by your facility's leadership to allow RNs to enter orders for medications for Veterans (signed by a provider). Please think of the time period between July and December of this year.

Did you have Nurse Protocols (NP) for Lipids?	No= 0 Yes= 1
NP-Hypertension?	No= 0 Yes= 1
NP-Diabetes?	No= 0 Yes= 1
Level of NP use?	1 2 3 4 5
Rationale for rating:	

5. Transitions from ED

Now I'd like to ask you about coordinating transitions between Primary Care and the Emergency Department. Please think of the time period between July and December of this year.

Did the PACT Teams have methods for identifying and tracking patients for Post ED contact?	No= 0 Yes= 1
What patients were targeted for Post ED contact?	1.
Approximately how many patients received a Post ED contact?	1.
Level of Post ED contact?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Did care managers or members of teamlet attempt to contact patients within 24 hours of discharge from the Emergency Department?

b) Did you have a way of tracking the calls you make?

c) Did you have a way of tracking successful or completed calls to patients?

d) Did you have a service agreement in place with the emergency department?

e) Did you have any procedures in place to identify patients discharged from ED outside VA?

6. Transitions from Hospital/Inpatient Unit

Now I'd like to ask you about coordinating transitions between the Inpatient Units, and Primary Care, or post Discharge contact. Please think of the time period between July and December of this year.

Did the PACT Teams have methods for identifying and tracking patients for post discharge contact [from inpatient units]?	No= 0 Yes= 1
What patients were targeted for post discharge contact?	1.
Approximately how many patients received a post discharge contact?	1.
Level of post discharge contact?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year …

a) Who contacted patients for post discharge contact? i.e., which member of the PACT team?

b) Is contact by clinical member of PACT team made within 2 business days of discharge?

c) Does your site do any transition planning and coordination with other VA departments and facilities?

d) Do you have any mechanisms/processes to improve transition? (e.g., templated hand-off note; adding member of teamlet as co-signer on discharge note; other mechanisms/processes to ensure teamlet receives notification and necessary information about discharged patient)

e) Did you have any procedures in place to identify patients discharged from inpatient units from hospitals outside of VA?

7. Alternatives to Single Face-to-Face Visits

Now I'd like to ask about alternatives to single provider face-to-face care. Please think of the time period between July and December of this year.

Did you offer: Group Visits? By group visits we mean shared medical appointments when multiple patients receive care in a group setting (not groups that meet primarily for support or educational/informational	No= 0 Yes= 1

purposes).	
Phone visits	No= 0 Yes= 1
Secure Messaging	No= 0 Yes= 1
Who was the target population for each method?	1.
Level of use of alternatives to Face-to-Face?	1 2 3 4 5
Rationale for rating:	

8. Changes to Enhance Access

Now I'd like to ask about some other changes that may have been implemented to enhance patient access. Please think of the time period between July and December of this year.

Were there any strategies in place for enhancing patient access to care?	No= 0 Yes= 1
Were schedule scrubbing methods in place?	No= 0 Yes= 1
Were you extending visit intervals when appropriate?	No= 0 Yes= 1
Were you using any other methods to enhance access?	1. 2.
Level of Enhanced Access?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Did patients have Phone access to teamlet (i.e., direct phone access to RN care manager/team members)?

b) Did patients have access to appointments with other members of the team?

c) Did providers have open slots in their schedules to accommodate same-day visits (report snapshot, feedback in interviews)? Were those slots at an appropriate hour (based on when need is greatest)?

9. Multidisciplinary Teams

Please think of the time period between July and December of this year. I'd like to talk about the composition of your PACT team. In addition to the core team, did any of the teams have a designated…

Clinical Pharmacist? Is 1 Clinical Pharmacy Specialist assigned to 3 PACT team/panels? If no, what's the ratio per team or panel?	No= 0 Yes= 1
Social Worker? Is 1 Social Worker assigned to 2 PACT teams/panels? If no, what's the ratio per team or panel?	No= 0 Yes= 1
Nutritionist? Is 1 Nutrition/Dietitian assigned	No= 0 Yes= 1

to 5 PACT teams/panels? If no, what's the ratio per team or panel?	
Health Behavior Coordinator (HBC)?	No= 0 Yes= 1
Health Promotion and Disease Prevention Manager (HPDP)?	No= 0 Yes= 1
My Healthy Vet coordinator?	No= 0 Yes= 1
Other?	No= 0 Yes= 1 Who=
Level of Multidisciplinary Team use?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Did extended team members attend PACT steering committee meetings?

b) Which of the extended team members were available to teams and were actively engaged in supporting teams?

c) Were extended team members knowledgeable about PACT?

d) Were extended team members knowledgeable about their role in PACT?

e) Were extended team members available to PACT teams through attendance at huddles, consultative model, co-management of patients, attendance at Interdisciplinary meetings to discuss complex patients, etc.?

10. Team Communication and Functioning

We are also interested in efforts to support and enhance team communication and functioning. Again thinking of the time period between July and December of this year…

Were there Team Functioning policies in place? For example, business rules or rules of engagement or written policies for team functioning.	No= 0 Yes= 1
Did you have regular PACT team meetings?	No= 0 Yes= 1
Did you have contingency plan to ensure continuity of care?	No= 0 Yes= 1
Level of team communication and functioning?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Do you think that team members at different levels felt heard or had a voice?

b) Did position descriptions that you have at the site align with PACT (position descriptions)?

c) Do you think that RN care managers felt comfortable with what they were being asked to do?

11. Patient-centeredness

Finally, I'd like to ask a few questions about patient-centeredness – that is, what kinds of things are being done to assess and enhance patients' experiences and engagement in their own care. Please think of the time period between July and December of this year.

Were there methods for engaging patients in their care? Which ones? (goal setting, cultural competent staff, etc. from the list)	No= 0 Yes= 1 1. 2. 3.
Were there methods for measuring patient-centeredness/patient experience? If POC reports using/looking at SHEP scores: What steps, if any, have teams taken to improve SHEP scores?	No= 0 Yes= 1
Please offer examples of methods used:	1. 2.
Level of use of Pt Centeredness methods?	1 2 3 4 5
Rationale for rating:	

Again, thinking of the time period between July and December of this year…

a) Were your providers trained in Motivational Interviewing?

b) Were your providers using Motivational Interviewing?

c) Did you have any processes or strategies in place to involve family and caregivers in patients' care?

d) Did you have any processes or strategies in place to develop plan of care with patients that includes shared goal-setting?

e) Did you have any methods in place to educate patients about PACT?

f) Did you have any methods in place to capture patient perceptions of PACT?

g) Did you have any methods in place to measure patient satisfaction with processes of care?

Wrap-up:

That was my last question. Is there anything else I haven't asked about that you think I should have asked? Anything you think is important for understanding how PACT is being implemented at (facility name)?

Do you have any questions for me?

We plan to follow up with you in 6 months to check in and see what has changed about PACT implementation. In the meantime, please feel free to contact me if you have any questions about this project.
If there is nothing else, I'd like to thank you very much for taking the time to talk with me today. This conversation has been enormously useful, so thanks for your cooperation and contribution to our project. Have a great day.

eAppendix 2: Patient Experience of Care Domains

How Well Doctors/Nurses Communicate Score	Question 15. In the last 12 months, how often did your personal VA doctor or nurse explain things in a way that was easy to understand? Question 16. In the last 12 months, how often did your personal VA doctor or nurse listen carefully to you? Question 18. In the last 12 months, how often did your personal VA doctor or nurse show respect for what you had to say? Question 19. In the last 12 months, how often did your personal VA doctor or nurse spend enough time with you? Filters: Question 13. A personal doctor or nurse is the one you would see if you need a checkup, want advice about a health problem or get sick or hurt. Do you have a personal VA doctor or nurse? [Response options: Yes, No] Question 14. In the last 12 months, how many times did you visit your personal VA doctor or nurse to get care for yourself? [Response options: None, 1, 2, 3, 4, 5 to 9, 10 or more] Responses to Questions 15, 16, 18, and 19 were used only if response to Question 13 was 'yes' or blank and response to Question 14 was not 'None.' Questions 15, 16, 18, and 19 have the following response scale: Never, Sometimes, Usually, Always. The score on each item is calculated as the percentage of responses that fall in the top category (Always). How Well Doctors/Nurses Communicate is then calculated as the average of the site's scores on the four items.
Rating of Personal Doctor/Nurse Score	Question 20. Using any number from 0 to 10, where 0 is the worst personal doctor/nurse possible and 10 is the best personal doctor/nurse possible, what number would you use to rate your personal VA doctor/nurse? Filter: Question 13. A personal doctor or nurse is the one you would see if you need a checkup, want advice about a health problem or get sick or hurt. Do you have a personal VA doctor or nurse? [Response options: Yes, No] Responses to Question 20 were used only if response to Question 13 was 'yes' or blank. Question 20 has the following response scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The reporting measure is calculated as the percentage of responses that fall in the top two categories (9, 10).
Getting Needed Care Score	Question 12. In the past 12 months, how often was it easy to get the care, tests or treatment you thought you needed through VA? Filter: 12**.** Question 11. In the past 12 months, did you try to get any care, tests or treatment through VA? [Response options: Yes, No] Response to

	Question 12 was used only if response to Question 11 was 'yes' or blank. Question 22. In the last 12 months, how often was it easy to get appointments with VA specialists? Filter: Question 21. Specialists are doctors like surgeons, heart doctors, allergy doctors, skin doctors, and other doctors who specialize in one area of healthcare. In the last 12 months, did you try to make any appointments to see a VA specialist? [Response options: Yes, No] Response to Question 22 was used only if response to Question 21 was 'yes' or blank. Questions 12 and 22 have the following response scale: Never, Sometimes, Usually, Always. The score on each item is calculated as the percentage of responses that fall in the top category (Always). Getting Needed Care is then calculated as the average of the site's scores on the two items.
Overall Rating of VA Healthcare Score	Question 10. Using any number from 0 to 10, where 0 is the worst healthcare possible and 10 is the best healthcare possible, what number would you use to rate all your VA healthcare in the last 12 months? Question 10 has the following response scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The reporting measure is calculated as the percentage of responses that fall in the top two categories (9, 10).
Getting Care Quickly Score	Question 2. In the last 12 months, when you needed care right away, how often did you get care as soon as you thought you needed? Filter: Question 1. In the last 12 months, did you have an illness, injury, or condition that needed care right away in a clinic, emergency room, or doctor's office? [Response options: Yes, No] Response to Question 2 was used only if response to Question 1 was 'yes' or blank. Question 4. In the past 12 months, not counting the times you needed care right away, how often did you get an appointment as soon as you thought you needed? Filter: Question 3. In the last 12 months, not counting the times you needed care right away, did you make any appointments for your healthcare at a doctor's office or clinic? [Response options: Yes, No] Response to Question 4 was used only if response to Question 3 was 'yes' or blank. Questions 2 and 4 have the following response scale: Never, Sometimes, Usually, Always. The score on each item is calculated as the percentage of responses that fall in the top category (Always). Getting Care Quickly is then calculated as the average of the site's scores on the two items.